RECENT AND FOSSIL SPECIES OF THE SCAPHOPOD GENUS DENTALIUM IN SOUTHERN AUSTRALIA

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I INTRODUCTION

Even a casual survey of the specimens of South Australian Scaphopoda, and of the literature upon them, reveals much confusion and haphazard identification of species. The following short account is, therefore, submitted as an attempt to point out discrepancies to those students who find difficulty in the correct naming of already known forms.

Both recent and fossil specimens have been examined, the latter chiefly from the Tate Museum, Adelaide University (including the Abattoirs Bore material), and the Commonwealth Palaeontological Collection at Canberra. The recent shells are well represented in the South Australian Museum in the Verco Collection, which has provided data for the elucidation of numerous errors in previous accounts of the Scaphopoda.

II RECENT SPECIES

The majority of the recent South Australian *Dentalium* species form a fairly distinctive subgenus, *Paradentalium* (subgenotype *D. bednalli* Pilsbry and Sharp, 1898), introduced for shells with six to fourteen intercalating ribs, usually continuing to the aperture or becoming obsolete, the intervals apparently smooth but microscopically concentrically and longitudinally striate; apex small; orifice simple, without terminal pipe, slit or notch.

In this subgenus can be included *D. bednalli, D. octoplcuron, D. hemilcuron, D. franciscnse, D. flindersi* sp. nov., and *D. tasmaniensis.*

In the second subgenus *Eudentalium* (genotype *D. quadricostatum* Brazier) Cotton and Godfrey, 1933, we place *D. beachportensis* sp. nov.; the subgenus being distinguished by the small, solid, square tube, serrate primary ribs and

smooth interstices. The two species *D. bordaensis* sp. nov. and *D. hyperhemileuron* probably belong to the subgenus *Episiphon* Pilsbry and Sharp, while *D. verconis* sp. nov. and *D. jaffaensis* are placed in the subgenus *Fissidentalium* Fischer.

Class SCAPHOPODA

Family DENTALIIDAE

Genus DENTALIUM Linne, 1758

Subgenus PARADENTALIUM Cotton and Godfrey, 1933

The South Australian recent species grouped under *Paradentalium* may be distinguished by the following key:

1 Ribs persistent through entire length of shell:
  (1) Interspaces wide, ribs 7-12:
    (a) Ribs 7, increasing to 10 .. .. *D. bednalli*
    (b) Ribs 12 .. .. *D. flindersi*
    (c) Ribs 8, remaining constant in number and size .. .. *D. octopleuron*
  (2) Interspaces linear, ribs 14 .. .. *D. francisense*
2 Ribs obsolete or absent at the anterior end .. .. *D. hemileuron*

DENTALIUM BEDNALLI Pilsbry and Sharp, 1898

D. bednalli Pilsbry and Sharp, 1898 Tryon's Man. Conch., **17**, 248, pl. xxxix, figs. 1-3; Cotton and Godfrey, 1933, S.A. Nat., **14**, (iv), 142
D. intercalatum Cotton and Godfrey, 1933 *id.*, 140, non Gould, 1859
D. decemcostatum Cotton and Godfrey, 1933 *id.*, 143, non Brazier, 1877
D. katowense Cotton and Godfrey, 1933 *id.*, 141, non Brazier, 1877

Type Locality—Gulf St. Vincent, S. Aust.

This is the correct name for the shell previously known in South Australia as *D. intercalatum*. Cotton and Godfrey, in introducing the subgenus *Paradentalium*, based it on the South Australian species *D. bednalli* Pilsbry and Sharp, but *D. intercalatum* Gould was quoted as genotype following Verco's incorrect identification of the South Australian shell. The South Australian species had already been described as *D. bednalli* Pilsbry and Sharp, and that was the species under discussion. The latter should now be regarded as the subgenotype.

D. katowense and *D. decemcostatum* have also been incorrectly used for some South Australian specimens of this species. The nearest allied species is *D. tasmaniensis* T. Woods (north-west coast of Tasmania) which has been recorded from Port Adelaide, but is not represented in our collection from South Australia. Subfossil specimens so named from the Port Adelaide River are somewhat intermediate between *D. bednalli* and *D. tasmaniensis;* mature specimens show the typical intercalate ribbing of the so-called South Australian "*intercalatum.*"

Dentalium flindersi sp. nov.

Pl. xii, fig. 4

D. duodecimcostatum Cotton and Godfrey, 1933 S.A. Nat., **14,** fig. 4, 141, non Brazier, 1877

Holotype—S.A. Mus. Coll. Reg. No. D. 13,338.

Shell medium size, solid, white, rather well curved towards the posterior; aperture regular and circular, displaying the twelve longitudinal ribs; apex fairly large, orifice small, oval, longer than wide, walls thick; sculpture of twelve narrow, rounded ribs, separated by deep, concave, decidedly wider intervals; ribs becoming wider anteriorly with a tendency to splitting by progressively deepening sulci, but not reaching the decidedly intercalate condition of *D. bednalli.*

Dimensions—Length, 21 mm.; breadth, 2·9 mm.

Recent. Flindersian, shallow water.

Type Locality—Gulf St. Vincent, 22 fathoms.

Observations—This is a shell previously listed from South Australia as *D. duodecimcostatum* Brazier (type locality, Darnley Island, Torres Strait, 30 fathoms), an entirely different species.

DENTALIUM OCTOPLEURON Verco, 1911

D. octogonum Angas, 1878 Proc. Zool. Soc., 868, non Lamarck

D. octopleuron Verco, 1911 Trans, Roy. Soc. S.A., **35,** 206; Cotton and Godfrey, 1933 S.A. Nat., **14,** (iv), 143

D. cheverti Cotton and Godfrey, 1933 *id.*, 141, non Pilsbry and Sharp

D. robustum Cotton and Godfrey, 1933 *id.*, 143, non Brazier.

D. thetidis Cotton and Godfrey, 1933 *id.*, 142, non Hedley

This species is closely related to *D. bednalli.* It was misnamed *D. octogonum* by Angas, and South Australian specimens labelled *D. cheverti, D. robustum, D. thetidis* are this species.

Recent, Flindersian, shallow water.

DENTALIUM TASMANIENSIS Tenison Woods, 1877

D. tasmaniensis T. Woods, 1877 Proci. Roy. Soc. Tas. for 1876, 140; Cotton and Godfrey, 1933 S.A. Nat., **14,** No. 4, 144

Type Locality—North-west coast of Tasmania.

Recent, Flindersian, Tasmania and Victoria only.

This species is allied to *D. bednalli* from South Australia; subfossils from the Port Adelaide River approach very closely to *D. tasmaniensis.*

DENTALIUM FRANCISENSE Verco, 1911

D. francisense Verco, 1911 Trans. Roy Soc. S.A., **35,** 207, pl. xxxvi, figs. 1, 1A; Cotton and Godfrey, 1933 S.A. Nat., **14,** No. 4, 143, pl. i, figs. 1, 1A

Type Locality—Petrel Bay, Franeis Island, S.A., 15-20 fathoms.
Recent, Flindersian, shallow water.

This species is also elosely related to *D. bednalli.*

DENTALIUM HEMILEURON Vereo, 1911

D. hemileuron Vereo, 1911 Trans. Roy. Soc. S. Aust., **35,** 208, pl. xxxvi, fig. 2; Cotton and Godfrey, 1933 *loc cit.,* 144, pl. i, fig. 2

Type Locality—Cape Jaffa, 300 fathoms.

Recent, Flindersian, deep water.

Subgenus EUDENTALIUM Cotton and Godfrey, 1933
(Genotype *D. quadricostatum* Brazier)

Dentalium beachportensis sp. nov.
Pl. xii, fig. 2

D. quadricostatum Cotton and Godfrey, 1933 *loc. cit.,* 145, non Brazier

Holotype—S.A. Mus. Coll., Reg. No. D. 13,339.

Shell almost square, opaque white, very slowly inereasing, four-angled, with a wide, distinct rib at each angle; interstices sunken, obsoletely longitudinally striate; apparently the ribs are obsoletely serrated; apex perforated, narrow, entire; aperture square, narrow, peristome very thick. The unique specimen is broken and eroded, but it is apparently distinct from *D. quadricostatum.*

Dimensions—Length, 17 mm.; breadth, 2·5 mm.

Recent, Flindersian, deep water.

Type Locality—Beachport, S.A., 110 fathoms.

Subgenus EPISIPHON Pilsbry and Sharp, 1897
(Genotype *D. sowerbyi* Guilding)

Dentalium bordaensis sp. nov.
Pl. xii, fig. 3

D. virgula Cotton and Godfrey, 1933 *loc. cit.,* 145, non Hedley

Holotype—S.A. Mus. Coll., Reg. No. D. 13,340.

Shell of medium size, very slightly eurved and very gradually tapering, circular, polished, white; aecremental striae fine and regular; aperture round, peristome thin; apex large with a narrow tube projeeting from the centre of the disc, closing the posterior end; this appendix is visible in very early life, when the shell is extremely narrow. In the still earlier stages of growth, when the appendix is absent, the shell resembles *D. jaffaensis,* but has straighter sides, as it does not widen so rapidly; the present specimens have more marked eoncentric striations.

Dimensions—Shell: Length, 19 mm.; breadth, 2 mm. Appendix: Length, 1 mm.; breadth, ·3 mm.

Recent, Flindersian, deep water.

Type Locality—Cape Borda, S.A., 60 fathoms.

Observations—This shell is much larger, thicker and straighter than the Peronian *D. virgula*.

DENTALIUM HYPERHEMILEURON Verco, 1911

D. hyperhemileuron Verco, 1911 Trans. Roy. Soc. S. Aust., 35, 217, pl. xxvi, figs. 3, 3A; Cotton and Godfrey, 1933 *loc cit.*, 146, pl. i, figs. 3, 3A

Type Locality—King George Sound, W.A.

Recent, Flindersian, shallow water.

Subgenus FISSIDENTALIUM Cossmann, 1888
(Genotype *Dentalium ergasticum* Fischer)

Dentalium verconis sp. nov.
Pl. xii, fig. 1

D. zelandicum Cotton and Godfrey, 1933 *loc. cit.*, 145, non Sowerby

Holotype—S.A. Mus. Coll., Reg. No. D. 13,341.

Shell large, white, very solid, slightly curved towards the posterior end; aperture irregular, dorsally produced; peristome thin and sharp, displaying the numerous longitudinal ribs; apex fairly large, orifice small, walls thick; a simple, short, ventral fissure about 2 mm. in length; sculpture of numerous (about twenty) primary, narrow, rounded ribs at the anterior end, of subequal strength, with only two or three in all minor intercalations; interspaces wider, both ribs and interspaces crossed by regular, fine, oblique, growth-striae.

Dimensions—Length, 47 mm.; breadth, 6 mm.

Type Locality—Beachport, S.A., 200 fathoms.

Recent, Flindersian, deep water.

Observations—This species has been recorded as *D. zelandicum* Sowerby (type locality, New Zealand) from South Australia, but differs in having only half as many primary ribs which are subequal, not unequal; the maximum size of the species is less than the average adult *zelandicum*.

Dentalium jaffaensis sp. nov.
Pl. xii, fig. 5

D. lubricatum Cotton and Godfrey, 1933 *loc. cit.*, 145, pl. i, figs. 4, 4A, non Sowerby

Holotype—S.A. Mus. Coll., Reg. No. D. 13,337.

Shell of medium size, smooth, polished, white, gradually increasing in diameter, slightly curved; aperture regular, peristome thin, easily broken; apex small, with no slit in the early stage of growth but a central posterior aperture; protoconch an elliptical bulb with a very short, slightly contracting, round, tubular posterior prolongation set somewhat obliquely to the axis of the bulb and directed

towards the convex side of the shell; opaque transverse rings appear in the first 1·5 mm. of the shell, and the adult has a slit at the posterior end on the convex or ventral side.

Dimensions—Length, 24 mm.; breadth, 2·7 mm.

Type Locality—Cape Jaffa, S.A., 90 fathoms.

Recent, Flindersian, deep water.

Observations—Related to the Peronian *D. lubricatum* Sowerby and *D. virgula* Hedley, but more slender, straighter, and less rapidly expanding than *D. lubricatum*.

III FOSSIL SPECIES

For the most part, fossil species have provided little difficulty. Almost all were described by Tate in 1887 and 1899, lists of localities being published in each case. Further localities have been recorded by Chapman in his work on the Mallee and other Victorian bores, including (with Miss I. Crespin and R. A. Keble) the Sorrento Bore, and by Howchin in papers upon bores in the Adelaide basin. Additional localities are here listed, specimens from which, unless otherwise stated, are in the Commonwealth Palaeontological Collection at Canberra.

Class SCAPHOPODA

Family DENTALIIDAE

Genus DENTALIUM Linne, 1758

Subgenus FISSIDENTALIUM Fischer, 1885
(Genotype *D. ergasticum* Fischer, 1882)

DENTALIUM BIFRONS Tate

Dentalium (?) *bifrons* Tate, 1887 Trans. Roy. Soc. S. Aust., **9**, 192, pl. xx, fig. 5; Harris, 1897 Cat. Tert. Moll. Brit. Mus., 295; Tate, 1899 Trans. Roy. Soc. S. Aust., **33**, 261

Type Locality—Lower Pliocene, Muddy Creek, Victoria.

Locality not previously recorded—Abattoirs Bore, S.A., Lower Pliocene (Howchin, Upper Pliocene), in Tate Mus. Coll. Adel. Univ.

DENTALIUM MANTELLI Zittel

Dentalium sp. nov. Mantell, 1850 Quart. Journ. Geol. Soc., **6**, 331, pl. xxviii, fig 15

Dentalium mantelli Zittel, 1864 Novara-Exped., Neu-Seeland. Abth. Palae., 45, pl. xiii, figs. 7A, 7B

Entalis mantelli Zittel: Tate, 1887 Trans. Roy. Soc. S. Aust., **9**, 190

Dentalium mantelli Zittel: Pilsbry and Sharp, 1897 Man. Conch., **17**, 208; Harris, 1897 Cat. Tert. Moll. Brit. Mus., (i), 293; Tate, 1899 Trans. Roy. Soc. S. Aust., **23**, 261

D. (Entalis) mantelli Zittel: Howchin, 1935 *id.*, **59**, 74, 75

Type Locality—Oligocene, The Cliffs, Nelson, New Zealand.

The very lengthy synonymy of *D. mantelli* is here reduced to references concerning Australia only; those relating to the occurrence of the species in New Zealand are listed by Suter, N.Z. Geol. Surv. Pal., Bull. No. 2, (i), 32.

This is a very variable species, common in both Australia and New Zealand. It presents difficulty in that the early references do not properly designate the type. Both Zittel and Suter place The Cliffs near Nelson first in the list of localities, thus apparently excluding Mantell's Onekakara shell. It seems that one must accept Zittel's figured specimen from The Cliffs as the holotype, which Suter states is in the K.K. Höfmuseum, Vienna.

The type locality, moreover is a poor collecting ground, so that it is difficult to obtain specimens of true *mantelli*. Tate (1877) states that a comparison of authentic specimens was made by him; Suter's figures of plesiotypes agree with Australian specimens, in view of which we here retain the identity of the Australian with the New Zealand species.

Localities not previously recorded:

Outcrops—Bird Rock, Torquay, Vic., Lower Miocene; 3 miles west of Gellibrand R., Vic., L. Miocene; Clifton Bank, Muddy Ck., Vic., L. Miocene; Skinner's, Bairnsdale area, Vic., L. Miocene; "Goodwood," Hawkesdale, Vic., L. Pliocene (Kalimnan).

Borings—P. of Colquhoun No. 1, Lakes Entrance Devel. Co., L. Bunga, Vic., 903 ft., Upper Oligocene; P. of Nindoo, Gippsland, Vic., 208 ft., L. Miocene; P. of Meerlieu, Gippsland, Vic., 570 ft., L. Miocene; New Shaft, Altona, Vic., 226 ft., L. Miocene; Hamilton Bore, Vic., 20-25 ft., L. Miocene; Oil Search Steam Drill, P. of Coolgulmerung, Gippsland, Vic., 300-334 ft., L. Pliocene (Kalimnan).

Subgenus Paradentalium Cotton and Godfrey, 1933
(Genotype *D. bednalli* Pilsbry and Sharp)

Dentalium aratum Tate

Dentalium aratum Tate, 1887 Trans. Roy. Soc. S. Aust., 9, 192, pl. xx, fig. 8; Tate, 1899 idem, 23, 265

Type Locality—Lower Miocene, River Murray Cliffs.

Localities not previously recorded:

Outcrops—3 miles west of Gellibrand R., Vic., L. Miocene; Clifton Bank, Muddy Creek, Vic., L. Miocene.

Borings—No. 1, P. of Bumberrah (Metung), Vic., 180-190 ft., L. Pliocene (Kalimnan); No. 1, P. of Bengworden, Gippsland, Vic., 470 ft., L. Pliocene (Kalimnan).

DENTALIUM LATESULCATUM Tate

D. latesulcatum Tate, 1899 Trans. Roy. Soc. S. Aust., **23,** 262, pl. viii, fig. 9

Type Locality—Lower Pliocene, Grange Burn, near Hamilton, Vic.

Locality not previously recorded:

Boring—No. 3, Lakes Entrance, Vic., 90 ft., L. Pliocene (Kalimnan).

DENTALIUM SEMIARATUM Chapman and Crespin

Dentalium semiaratum Chapman and Crespin, 1928 Rec. Geol. Surv. Vic., **5,** (i), 105, pl. vi, fig. 28

Type Locality—Lower Pliocene, Sorrento Bore, 719 ft.

Localities not previously recorded:

Borings—P. of Meerlieu, Gippsland, Vic., 260 ft., Middle Miocene; No. 14, P. of Stradbroke, Gippsland, Vic., 245 ft., Lower Pliocene; No. 15, P. of Stradbroke, Gippsland, Vic., 440 ft., Upper Oligocene.

Dentalium howchini sp. nov.

Pl. xii, fig. 6

D. elephantinum Tate, 1890 Trans. Roy. Soc. S. Aust., **13,** (ii), 177, non Linne

D. octogonum Tate, 1890 *id.*, non Lamarck

D. sectum, Tate, 1890 *id.*, non Deshayes

D. intercalatum Howchin, 1936 Trans. Roy. Soc. S. Aust., **60,** 16, non Gould

D. intercalatum aratum Howchin, 1936 *id.*, non Tate

D. intercalatum francisense Howchin, 1936 *id.*, non Vereo

D. intercalatum var. Howchin, 1936 *id.*, 17

D. sp. Howchin, 1936 *idem*

Holotype—Tate Mus. Coll., Adel. Univ.

Shell large, white, boldly sculptured with intercalating ribs numbering in the holotype 13; interstices average about the width of the ribs or a little narrower; the ribs split towards the anterior end by gradually deepening sulci; accremental striae irregular and rather coarse in places; aperture rounded, peristome regular, fairly thick, undulated on the exterior by the section of the ribs; posterior opening small.

Dimensions—Length, 45 mm.; breadth, 7 mm.

Type Locality—Abattoirs Bore, S.A., Lower Pliocene (Howchin "Adelaidean," Upper Pliocene).

Paratypes—In various specimens, the number of primary ribs varies from 7 to 16; splitting of the ribs towards the anterior by gradually deepening sulci frequently doubles the number of ribs.

Observations—This is a very variable species, related to *D. mantelli*, from which it differs in being much more boldly sculptured and in having a dominant intercalating system of ribs. It is somewhat like the common New Guinea fossil species *D. subrectum* Mart., which has narrower ribs.

Subgenus GRAPTACME Pilsbry and Sharp, 1897
(Genotype *D. semistriatum* Turton)

DENTALIUM SECTIFORME Tate

D. sectiforme Tate, 1899 Trans. Roy. Soc. S. Aust., **23,** 262, pl. viii, figs. 6, 6A

Type Locality—Lower Pliocene, Muddy Creek, Vic.

Subgenus LAEVIDENTALIUM Cossmann, 1888
(Genotype *D. incertum* Deshayes)

DENTALIUM SUBFISSURA (Tate)

Entalis subfissura Tate, 1887 Trans. Roy. Soc. S. Aust., **9,** 191, pl. xx, figs. 4A, 4B

Dentalium subfissura Tate: Harris, 1897 Sat. Tert. Moll. Brit. Mus., 296; Tate, 1899 Trans. Roy. Soc. S. Aust., **23,** 263

Type Locality—Lower Miocene R. Murray Cliffs, S. Aust.

Localities not previously recorded:

Outcrop—Clifton Bank, Muddy Creek, Vic., Lower Miocene.

Borings—New Shaft, Altona, Vic., 226 ft., Lower Miocene; No. 8, P. of Glencoe, Gippsland, Vic., 570 ft., Lower Pliocene (Kalimnan); No. 1, P. of Bumberrah, Gippsland, Vic., 239 ft., Lower Pliocene (Kalimnan).

DENTALIUM PICTILE Tate

Entalis subfissura Tate: Tate and Dennant, 1896 Trans. Roy. Soc. S. Aust., **20,** (i), 134

Dentalium pictile Tate, 1899 *id.*, **23,** 263, pl. viii, fig. 8

Type Locality—Lower Miocene, Table Cape, Tas.

Locality not previously recorded:

Boring—New Shaft, Altona, Vic., Lower Miocene.

DENTALIUM LARGICRESCENS Tate

D. largicrescens Tate, 1899 Trans. Roy. Soc. S. Aust., **23,** 264, pl. viii, figs. 10, 10A

Type Locality—Lower Miocene, Beaumaris, Vic.

Localities not previously recorded:

Outcrops—Skinner's, Bairnsdale area, Vic., Lower Miocene; 3 miles west of Gellibrand R., Vic., Lower Miocene; Rose Hill, Vic., (?) Upper Miocene; Old Bunga, east of No. and Bore, L. Entrance, Vic., Lower Pliocene (Kalimnan).

Borings—No. 1, Kalimna Oil Co., Rigby Is., L. Entrance, Vic., 30-50 ft., Lower Pliocene (Kalimnan); No. 1, Kalimna Oil Co., Rigby Is.,

L. Entrance, Vic., 70 ft., Lower Pliocene (Kal.); Signal Hill, P. of Dulungalong, Vic., 300-650 ft., Lower Pliocene (Kal.); P. of Wulla Wullock, Vic., 432 ft. Lower Pliocene (Kal.); Darriman, No. 3, Vic., 66-76 ft. Lower Pliocene (Kal.); P. of Glencoe, No. 7, Vic., 170 ft., Lower Pliocene (Kal.); No. 1, P. of Bumberrah (Metung), Vic., 160-170 ft., Lower Pliocene (Kal.); No. 1, P. of Bumberrah (Metung), Vic., 170-180 ft., Lower Pliocene (Kal.); No. 1, P. of Bumberrah (Metung), Vic., 190-200 ft., Lower Pliocene (Kal.).

Dentalium lacteolum Tate

Dentalium lacteum Tate, 1887 Trans. Roy. Soc. S. Aust., **9**, 193, non Deshayes

D. lacteolum Tate, 1899 *id.*, **23**, 264

Type Locality—Lower Miocene, Muddy Creek, Vic.

Localities not previously recorded:

Outcrop—3 miles west of Gellibrand R., Vic., Lower Miocene.

Borings—Hamilton Bore, 25-30 ft., Lower Miocene; Hamilton Bore, 114-119 ft., Lower Miocene.

Subgenus Fustiaria Stoliczka, 1868
(Genotype *D. circinatum* Sowerby)

Dentalium acriculum (Tate)

Entalis acriculum Tate, 1887 Trans. Roy. Soc., S. Aust., **9**, 192, pl. xx, fig. 11

Dentalium acriculum Tate: Harris, 1897 Cat. Tert. Moll. Brit. Mus., 296; Tate, 1899 Trans. Roy. Soc. S. Aust., **23**, 264

Type Locality—Lower Miocene, Muddy Creek, Vic.

Dentalium australe Pilsbry and Sharp

Entalis annulatum Tate, 1887 Trans. Roy. Soc. S. Aust., **9**, 191, pl. xx, fig. 6A-6B

Dentalium australe Pilsbry and Sharp, 1898 Tryon's Man. Conch., **17**, 192, nom. mut. for *D. annulatum* Tate (preocc.); Tate, 1899 Trans. Roy. Soc. S. Aust., **23**, 264

Type Locality—Lower Miocene, Muddy Creek, Vic.

Locality not previously recorded: Bird Rock, Torquay, Vic., Lower Miocene.

Subgenus Episiphon Pilsbry and Sharp, 1898
(Genotype *D. sowerbyi* Guilding)

Dentalium tornatissimum Tate

D. tornatissimum Tate, 1899 Trans. Roy. Soc. S. Aust., **23**, 265, pl. viii, figs. 7-7A

Type Locality—Lower Pliocene (Kalimnan), Gippsland Lakes, Vic.

Localities not previously recorded:

Borings—No. 1, P. of Bumberrah (Metung), Vic., 90-100 ft., Lower Pliocene (Kal.); No. 1, P. of Bumberrah (Metung), Vic., 110-130 ft., Lower Pliocene (Kal.); No. 1, Kalimna Oil Co., Rigby Is., Lakes Entrance, 30 ft., Lower Pliocene (Kal.); No. 1, Kalimna Oil Co., Rigby Island, Lakes Entrance, 50 ft., Lower Pliocene (Kal.).

Subgenus GADILINA Foresti, 1895
(Genotype *D. triquetrum* Brocchi)

DENTALIUM TATEI Pilsbry and Sharp

Dentalium (?) *triquetrum* Tate, 1887 Trans. Roy. Soc. S. Aust., **9**, 193, pl. xx, fig. 3, non Brocchi

D. tatei Pilsbry and Sharp, 1898 Tryon's Man. Conch., **17**, 218, nom. mut.; Tate, 1899 Trans. Roy. Soc. S. Aust., **23**, 266

Type Locality—Lower Miocene, Adelaide Bore, S. Aust.

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VI EXPLANATION OF PLATE XII

Fig. 1 *Dentalium (Fissidentalium) verconis*, sp. nov. x 1·6
Fig. 2 *Dentalium (Eudentalium) beachportensis*, sp. nov. x 4
Fig. 3 *Dentalium (Episiphon) bordaensis*, sp. nov. x 4
Fig. 4 *Dentalium (Paradentalium) flindersi*, sp. nov. x 4·5
Fig. 5 *Dentalium (Fissidentalium) jaffaensis*, sp. nov. x 3·6
Fig. 6 *Dentalium (Paradentalium) howchini*, sp. nov. x 1·5